

DETERMINATION OF NUMBER OF STORIES ABOVE GRADE WORKSHEET

Building height Y (from grade plane determination worksheet) = _____ feet

Grade plane elevation = _____ feet

Lowest ground level elevation = _____ feet

Floor level designation	Floor level elevation	Story above grade (yes/no)	Finished floor elevation above > 6 feet above grade plane (yes/no)	50 % or more of finished floor level above > 6 ft above finished ground level (yes/no)	Finished floor level above > 12 feet above finished ground level (yes/no)

Stories above grade = (# of yes responses in column 3) + (# of yes responses in column 4) + (# of yes responses in column 5) + (# of yes responses in column 6) = _____ stories

Permitted number of stories from Table 503 including any modifications to the number of stories from IBC section 504 = _____ stories (this value must be equal to or greater than the number of "stories above grade" as calculated above)

INSTRUCTIONS FOR:
DETERMINATION OF NUMBER OF STORIES ABOVE GRADE PLANE

There are several factors that are required to determine the number of stories above grade plane. The first item that needs to be provided on this worksheet is building height Y as determined from the grade plane determination worksheet.

"Building height Y (from grade plane determination worksheet) = feet"

Value of Y is entered on the worksheet here

The grade plane elevation is the roof elevation minus the building height Y. This step provides the elevation of the grade plane in relation to all other floor levels of the building and allows direct comparisons to the other floor levels.

"Grade plane elevation = feet"

Grade plane elevation is entered on the worksheet here

The lowest ground level elevation also has to be provided on this worksheet. The lowest ground level elevation is the lowest elevation of the ground surface at any point along the perimeter of the building.

"Lowest ground level elevation = feet"

Lowest ground level elevation is entered on the worksheet here

The first column in the worksheet table is titled floor level designation and is used to reference the individual floors being considered. All floor levels of the building must be entered with a floor level designation and must be accounted for within the table. Roofs must also be entered as a floor designation if such roof is to be occupied. Please note that floor levels satisfying the requirements of mezzanines and penthouses do not need to be entered as floor levels.

The second column is titled floor level elevation and is the elevation of the floor level within column 1 being considered. Elevations of all floor levels need to be provided within the table. Roof elevations must also be entered under this column as a floor elevation if the roof level is occupied.

The third column is titled story above grade and a yes or no response is to be required for all floor levels. If the floor level elevation listed in column 2 is equal to or higher than the grade plane elevation then a **yes** response must be provided and the floor level being considered is a story above grade. If a yes response is provided within column 3 there is no need to provide the information for columns 4, 5, and 6 for that particular floor level being considered.

If the floor level elevation in column 2 is lower than the grade plane elevation then a **no** response must be provided in column 3. If a **no** response is provided in column 3, the floor level being considered may still be considered a story above grade plane and the remainder of the information within the table (columns 4, 5, and 6) must be provided. In order to determine if the floor level being considered is a story above grade plane, completion of the remaining portions of the worksheet table for such level being considered must be completed.

The remaining portions of the table (columns 4, 5, and 6) determines if floor levels with a floor level elevation lower than the grade plane are to be considered as basements or stories above grade plane. A basement is defined in section 502.1 of the IBC as that portion of a building partly or completely below grade plane. A basement is considered as a story above grade plane when **the finished surface of the floor above the basement** is:

- More than 6 feet above grade plane,
- More than 6 feet above the finished ground level for more than 50 percent of the total building perimeter, or
- More than 12 feet above the finished ground level at any point.

Note that it specifies "finished floor surface of the floor above the basement"

The fourth column is titled finished floor elevation above > 6 feet above grade plane and a yes or no response is required. This column is comparing the elevation of the **finished surface of the floor above** to the location of the calculated grade plane. If the finished surface of the floor above is greater than 6 feet above the grade plane then a **yes** response must be provided and the floor level being considered would be a story above grade plane. If a yes response is provided within column 4 there is no need to provide the information for columns 5 and 6 for that particular floor level being considered. Information must be provided within this column for all floor areas that had a no response within column 3.

If the finished surface of the floor above is less than 6 feet above the grade plane then a **no** response must be provided in column 4. If a **no** response is provided in column 4, the floor level being considered may still be considered a story above grade plane and the remainder of the information within the table (columns 5, and 6) must be provided. In order to determine if the floor level being considered is a story above grade plane, completion of the remaining portions of the worksheet table for such level being considered must be completed.

The fifth column is titled 50 % or more of floor level above > 6 feet above ground level and a yes or no response is required. This column is indicating if the percent of **finished surface of the floor above**, that is more than 6 feet above the location of the finished ground level for the entire building perimeter is greater than 50 %. If the finished surface of the floor above is greater than 6 feet above the finished ground level for more than 50 % of the building perimeter then a **yes** response must be provided and the floor level being considered would be a story above grade plane. If a yes response is provided within column 5 there is no need to provide the information for column 6 for the particular floor level being considered. Information must be provided within this column for all floor areas that had a no response within columns 3 and 4.

If the finished surface of the floor above is greater than 6 feet above the finished ground level for less than 50 % of the building perimeter then a **no** response must be provided in column 5. The floor level being considered may still be considered a story above grade plane and the information within column 6 must be provided.

The final column is titled finished floor level above > 12 feet above finished ground level and a yes or no response is required. This column indicates if any portion of the finished surface of the floor above is more than 12 feet above the finished ground level at any point. If the finished surface of the floor above is greater than 12 feet above the finished ground level at any point then a **yes** response must be provided and the floor level being considered would be a story above grade plane. Information must be provided within this column for all floor areas that had a no response within columns 3, 4, and 5.

If the finished surface of the floor above is less than 12 feet above the finished ground level at any point then a **no** response must be provided and the floor level being considered would not be a story above grade plane. If a no response is within columns 3, 4, 5, and 6 the floor level being considered would be a basement floor level and is not counted as being a floor level above grade plane.

When the information is provided for all floor levels of the building the total number of floor levels above grade plane is determined by counting the number of yes responses within columns 3, 4, 5, and 6. Please note that if we have a yes response provided in more than one column for a particular floor level being considered only one of the yes responses is counted. The total number of floor levels is then entered on the worksheet as shown below:

"Stories above grade = (# of yes responses in column 3) + (# of yes responses in column 4) + (# of yes responses in column 5) + (# of yes responses in column 6) = stories"

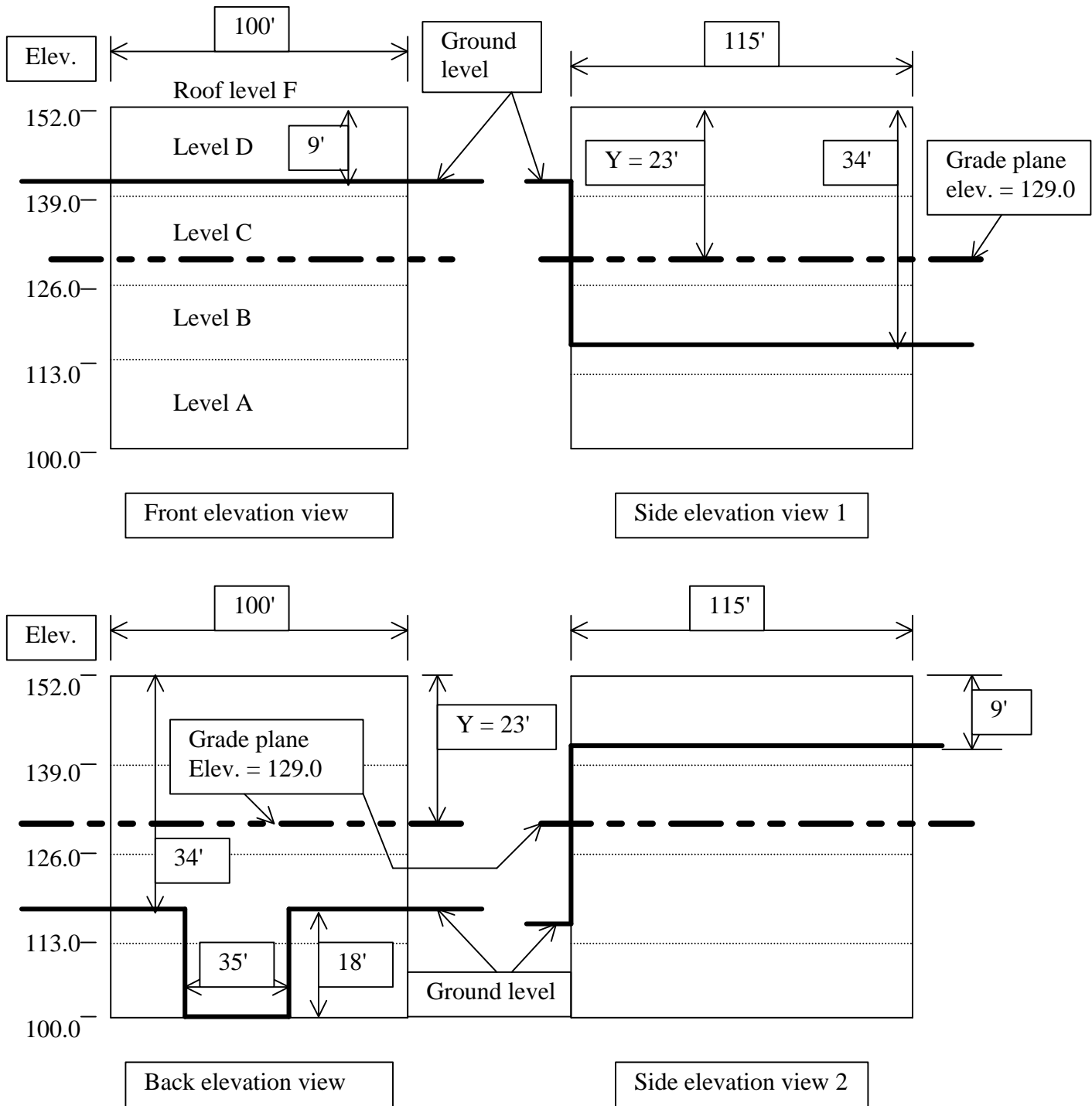
Enter value here

The final step to be completed on this worksheet is to determine the allowable number of stories above grade plane that is permitted by Table 503 of the IBC. The allowable number of stories indicated in Table 503 are based on occupancy groups and type of construction being utilized. Section 504 does allow the number of stories specified in the table to be increased by one for some occupancies when a complete automatic fire sprinkler system is being provided. The allowable number of stories based on Table 503 with any associated modifications from section 504 must be greater than or equal to the number of "stories above grade" as calculated above.

"Permitted number of stories from Table 503 including any modifications to the number of stories from IBC section 504 = stories"

Enter value here

EXAMPLE OF DETERMINATION OF NUMBER OF STORIES WORKSHEET



NOTE: For this example the roof area is considered occupied as such level will be used as a sundeck and lounge area for the occupants of the building. The building is classified as a Group B occupancy.

Steps required to complete determination of number of stories above grade plane

Step 1: Complete the grade plane determination worksheet to determine building height Y.

Step 2: Calculate the grade plane elevation. Remember grade plane elevation is the roof elevation minus the building height Y.

Step 3: Enter the lowest ground level elevation along the building's perimeter.

Step 4: Complete the table within the worksheet.

Step 5: Count up the number of **YES** responses within columns 3, 4, 5, and 6 and this is the number of stories above grade for the building.

STEP 1: The grade plane determination worksheet for the example shown above has been completed and is provided below:

GRADE PLANE DETERMINATION WORKSHEET

WALL DESIGNATION	WALL LENGTH	WALL AREA
Front elev.	100 feet	(100 X 9) = 900 square feet
Side elev. 1	115 feet	(115 X 34) = 3910 square feet
Back elev.	100 feet	(100 X 34) + (35 X 18) = 4030 square feet
Side elev. 2	115 feet	(115 X 9) = 4030 square feet

Total of all wall lengths (building perimeter) = 430 Feet

Total of all wall areas from above table = 9875 Square feet

Building height Y = (Total wall area / Total wall length) = (9875/430) = 23.0 Feet

Note that based on Table 503 of the IBC this building would be permitted to be of any type of construction.

STEP 2: The grade plane elevation must be calculated and for this example.

Grade plane elevation = Roof height elevation - building height Y

Grade plane elevation = (152.0 - 23.0) = 129.0 feet

STEP 3: Lowest finished ground floor elevation along the perimeter of the building must be determined and entered. Based on the elevations shown, the lowest finished ground elevation for this example is 100.0 feet.

DETERMINATION OF NUMBER OF STORIES ABOVE GRADE WORKSHEET:

Obtained from Step 1

Building height Y (from grade plane determination worksheet) = 23.0 feet

Grade plane elevation = 129.0 feet

Calculated in Step 2

Lowest ground level elevation = 100.0 feet

Determined in Step 3

A **YES** response was entered as the finished floor level above (139.0) is > 6 feet above the grade plane elevation.

A **YES** response was entered as 50 % or more of the finished floor level above (139.0) is > 6 feet above finished ground level for the building perimeter.

STEP 4: Complete the table within the worksheet.

Floor level designation	Floor level elevation	Story above grade (yes/no)	Finished floor elevation above > 6 feet above grade plane (yes/no)	50 % or more of finished floor level above > 6 ft above finished ground level (yes/no) (35/430) X 100 = 8% NO	Finished floor level above > 12 feet above finished ground level (yes/no)
Level A	100.0 feet	NO	NO		YES
Level B	113.0 feet	NO	NO	[(115 + 100)/430] X 100 = 50% YES	
Level C	126.0 feet	NO	YES		
Level D	139.0 feet	YES			
Level E (roof level)	152.0 feet	YES			

A **YES** response was entered as the floor level being considered was entirely above the grade plane elevation. Again note that the roof elevation is also considered a story above grade since the roof is occupied.

Please note that the shaded areas for this example do not need to be completed as a **YES** response was provided in one of the previous columns for the particular floor level being considered.

A **YES** response was entered as the finished floor level above (113.0) is > 12 feet above the lowest finished ground level elevation (100.0)

Stories above grade = (# of yes responses in column 3) + (# of yes responses in column 4) + (# of yes responses in column 5) + (# of yes responses in column 6) = 5 stories

The number of stories above grade is obtained by counting the number of **YES** responses within columns 3, 4, 5, and 6. For this example the building would have a **building height of 23.0 feet** and would be **5 stories above grade plane**

Permitted number of stories from Table 503 including any modifications to the number of stories from IBC section 504 = _____ stories

Based on Table 503 of the IBC and assuming the building is not protected by an automatic fire sprinkler system, the building would have to be of type IA, IB, IIA, IIIA, or IV construction as the building is classified as a business occupancy.